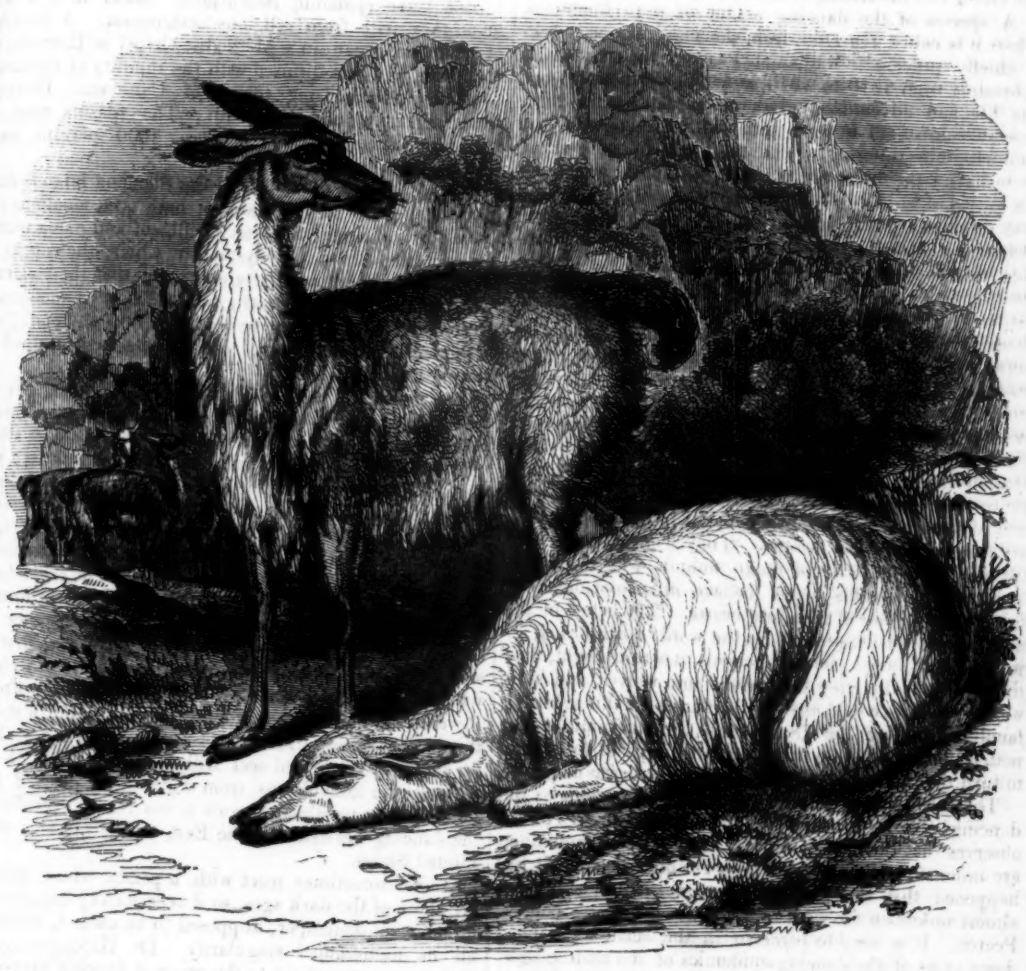
THE PENNY MAGAZINE

OF THE

Society for the Diffusion of Useful Knowledge.

491.] PUBLISHED EVERY SATURDAY. [NOVEMBER 30, 1839.

THE LLAMA AND ITS SILK WOOL.



[Llama. (Zoological Gardens.)]

THE genus Auchenia, which comprehends the llama and several allied species, is peculiar to the Cordilleras of Peru and Chili. The llamas may be regarded as the analogues of the camel and dromedary (genus Camelus, Linn.), being the American representatives of those animals, and approximating to them, if not in size, at least in structural conformation.* In outward form (setting aside the hump of the camel), in the great cellular development of the second stomach, in the cellular apparatus of the paunch, and the absence or rudimentary condition of the third or plicated stomach, with the concomitant power of enduring thirst, or abstaining for a long season from water,—in the form of the large full overhung eye,—in the division and mobility of the upper lip, the fissured nostrils, the slender neck and meagre limbs, together with the long woolly character of the clothing, the llama and the camel exhibit striking points of agreement. The foot of the camel however, with its broad elastic pad uniting the two toes except at their horn-covered tips, and expressly adapted for traversing the sands of the desert, differs in its modification from that of the llama, destined to inhabit the rough and rocky Cordilleras, along the craggy sides of which the animal proceeds fearlessly and securely. The foot of the llama consists of two slender springy toes completely divided, and provided at the end with a strong short hoof; these hoofs are pointed at the tip and hooked down somewhat like a claw; they are compressed laterally,—and the upper surface is in the form of an acute ridge, the under is linearly concave,—a form admirably fitted for a mountain climber. In each animal then, the foot is modified in accordance with their instincts and destined localities.

* Linnæus and other naturalists of the last century referred these animals to the genus Camelus. Illiger separated them from the camels into a distinct genus, to which he gave the name of Auchenia, in allusion to the length of the neck, from the Greek word αυχην, neck.

Like the camel, the llama is destitute of horns or of antlers,—has two incisor teeth in the upper jaw, and canines, —and no suborbital sinuses. Both are animals of patient, gentle habits, and are contented with coarse fare and a scanty diet.

When the Spaniards first invaded Peru and Chili, they found the llama domesticated and used as a beast of burden, its flesh and wool being also in great request,—it was, in fact, at once the camel and the sheep of the Peruvians,—it was their only beast of burden, its flesh was eaten, its skin prepared into leather, and its wool spun and manufactured into cloth. One of the labours to which the llama was subjected by the Peruvians was in bringing down ore from the mines among the mountains, —its ordinary load was from 80 or 100 to 150 pounds, and its average rate of travelling with this burden was from 12 to 15 miles a day, over rugged mountain-passes,—but, like the camel, if too heavily laden, it would lie down and obstinately refuse to proceed; nor would it bear to be urged beyond its natural and accustomed pace. Gregory de Bolivar estimates, that in his day three hundred thousand were employed in the transport of the produce of the mines of Potosi alone, and four millions annually killed for food. Augustin de Zarate, treasurer-general of Peru, in 1544, under the Spanish dominion, thus describes the llama, which he calls a *sheep*:—"In places where there is no snow, the natives want water; and to supply this they fill the skins of *sheep* with water and make other living sheep carry them; for it must be remarked, these *sheep* of Peru are large enough to serve as beasts of burden. They resemble the camel in their shape, although they have not the hump on the back, like that animal. They can carry about 100 pounds or more; and the Spaniards used to ride them, and they would go four or five leagues a day. When they are weary they lie down upon the ground; and as there are no means of making them get up, either by beating or assisting them, the load must of necessity be taken off. When there is a man on one of them, if the beast is tired and urged to go on, he turns his head round and discharges his saliva, which has an unpleasant odour, into the rider's face. These animals are of great use and profit to their masters, for their wool is very good and fine, particularly of that species termed *Pacas*, which have very long fleeces; and they are of little expense for nourishment, for a handful of maize suffices them, and they can go four or five days without water. Their flesh is as good as that of the fat sheep of Castile. There are now public shambles for the sale of their flesh in all parts of Peru where the animal is found, which was not the case when the Spaniards first came,—for when one Indian had killed a *sheep*, his neighbours came and took what they wanted, and then another Indian killed a sheep in his turn." Capt. G. Shelvocke, an Englishman, who sailed round the world in 1719-22, gives a very similar account, informing us that the Indians of Peru call these animals llamas, the Chilese chilihnegue, and the Spaniards carneros de la tierra. Holding, as it does, a conspicuous place among the wool-bearing animals, it is singular that after Europeans became acquainted with the llama, and of the uses made of its wool by the Peruvians, no exertions should, till recently, have been made towards the importation of its produce into Europe as an article of commerce, nor attempts instituted with regard to the naturalization of the animal in localities best fitted for its multiplication; and this more especially as the fineness of the wool had, from the first, attracted the notice both of the Spaniards and other Europeans. That no difficulty exists in the transportation of the llama to Europe, and that it bears our climate well, is abundantly proved by the numerous individuals which have lived both in the Gardens of the Zoological Society and in other places, and which, under the inevitable disadvantages of confinement, and perhaps too luxurious a diet, have continued long in health and vigour,—as long indeed as animals indigenous to Europe, under the same circumstances. There can be therefore no doubt but that if suffered to wander at large, in situations resembling, as nearly as possible, those of their native regions—be it remembered, of cold, and snow, and storms —these animals would thrive and multiply.

The herbage of the mountains, and the grass called *ycho*, which covers the slopes of the hills, constitute the natural diet of the wild llamas, so that, as far as frost is concerned, there would be no impediment to their naturalization in our island. If we consider that the mouñon, usually regarded as the wild type or origin of our domestic races of sheep, is a mountain animal, dwelling among the craggy and precipitous elevations of Corsica, Sardinia, Turkey in Europe, and the islands of the Grecian Archipelago, where it lives much in the manner of the wild llama, and reflect upon the ease with which the domestic varieties accommodate themselves to every variety of situation and temperature, and to all countries of the globe, we shall not find much to discourage in the simple and cheap experiment of bringing the llama into a state of semi-domestication, when no violence is done to the natural habits and instincts of the animal, and no sudden changes in diet and exercise forced upon it,—for surely the subjugation of the wild sheep, be it the mouflon of Sardinia or any other species, and the modification of habits to which it must have been subjected, even at the commencement of its loss of natural liberty, when man first took it under his own protection, must have involved difficulties equal if not superior to those attendant upon the naturalization of the llama, an animal already domesticated in its own country, and easily reconciled to such a condition of existence.

The objects of the naturalization of the llama in our country would not be either for the sake of its services as a beast of burden—for in that respect it holds but a very subordinate rank,—or for the sake of its flesh, which though esteemed by the Peruvians and the Spaniards, would not, we think, meet the taste of English palates,—but for the sake of its fine glossy silk-like wool, an article the value of which, for certain kinds of manufacture, has been of late fully appreciated by the French. Large quantities both of yarn or spun wool and of raw wool are sent to France, for the manufacture of shawls and stuffs of the most delicate texture, thus giving rise to a new branch of commerce.

At the ninth meeting (held at Birmingham) of the British Association for the Advancement of Science, the value of this article, namely, the silk-wool of the llamas, and the benefits which would result from the naturalization of these animals in our country, formed an interesting topic of discussion. The subject was introduced by Mr. W. Danson, who in illustration of his views exhibited samples of alpaca wools, and manufactured specimens in imitation of silk (and without dye) as black as jet. Mr. Danson urged that "the animals producing it ought to be propagated in England, Ireland, Scotland, and Wales, and stated that to the two latter places the alpaca is well suited, being an inhabitant of the Cordilleras or mountain district in Peru. Importations (of the wool) have already taken place to the extent of one million of pounds, and are likely to increase. There are five species of llamas; of these the alpaca has fine wool, six to twelve inches long, as shown by the specimens exhibited; the llama, coarse long hair; and the vicuña, a very short fine wool, more of the beaver caste. The Earl of Derby has propagated the alpaca in his private menagerie at Knowsley, and Mr. Danson understood that Mr. Stephenson, at Oban in Scotland, has a few of these animals. The wool of these animals would not enter into competition with the wool of the sheep, but rather with silk. It is capable of the finest manufacture, and is especially suited to the fine shawl trade of Paisley and Glasgow, &c. The yarns spun from

it are already sent to France in large quantities, at from 6*s.* to 12*s.* 6*d.* per pound, the price of the raw alpaca wool being now 2*s.* and 2*s.* 6*d.* per pound."

Mr. Vigors stated, "that one of the objects of the Zoological Society of London was to introduce animals which might be made available for draught, food, or clothing. Amongst others this animal has been kept in the Society's gardens. They bred and looked well, but were subject to disease, which was the case with most foreign animals at first. Animals were generally found adapted to the districts in which they lived, as the camel, &c., but animals which afforded food and clothing are usually capable of universal dispersion, as the horse, sheep, &c. He observed also that the llamas brought forth their young at an unseasonable period, Christmas; but that in general animals changed their season of bringing forth, in order to adapt it to the climate they lived in."

Such, we believe, is the substance of what transpired at the meeting relative to the subject.

The following observations we venture to submit as the result of our own experience. The naturalization of the llama will never succeed by placing the animal in confinement, and upon such a diet as cannot be avoided under such circumstances. Confinement in itself is the cause of many diseases,—some it immediately induces,—to others it predisposes; it is moreover difficult to measure the quantity of food, be its quality ever so appropriate, which an animal debarred from exercise, especially a foreign animal, of which much has to be learned by experience, ought to take, reference being had to its health. The Spanish and other writers acquainted with the llama in Peru, talk about it as very temperate, content with a handful of maize, or the mountain grass and herbage. Here then arises another difficulty, namely, that of rigidly adhering to the kind of food which is most adapted for the animal, and which, when many different herbivorous animals have to be fed and attended to upon a general system, cannot be scrupulously selected.

A sort of over-care in the liberal allowance of rich nutritious and stimulating food to an animal in confinement, feeding when in a state of nature upon coarse herbage and grass, is liable to defeat its own object. These and other circumstances should render us cautious in judging of the impediments in the way of acclimating any animal, from what occurs in keeping it in a state of confinement in menageries, &c., however admirably managed. We do not know that any attempts to naturalise animals by introducing them into menageries, with a view to their breeding and increase, have ever really succeeded, and we doubt whether they ever will.

With respect to the season at which the llama produces its young,—namely, Christmas, a cold season in our country,—we see little to deter from the trial of naturalization. The llama can bear cold, but not great heat; and doubtless if it became duly acclimatised, that is, constitutionally acclimatised, its breeding season would be that portion of the year corresponding in point of temperature and vegetation to the season of its reproduction in its own climate. Were a suitable locality selected, and a herd of llamas introduced, the care of them being made an exclusive point of attention, we doubt not of the success of the trial. Molina and some naturalists enumerate five species of llama,—namely, the llama, the guanaco, the alpaca or pacos, the vicugna or vicuña, and the hueco or arucana (Camelus Arucanus, Molina).

The guanaco, however, is most probably only the wild llama; the hueco may be a distinct species, but it is not well known. The guanaco, or wild llama (reserving the general name of llama for the domesticated animal), inhabits the Cordilleras of the Andes, especially of Peru and Chili; it prefers a middle region among the mountains, below the line of perpetual snows; and it migrates towards the valleys and lower hills on the approach of winter. It is at this season that the herds which now spread over the sheltered valleys and throng the defiles are hunted by the natives; the chase is both toilsome and arduous; it is indeed only with the young that there is much chance of success; the old ones are fleet and strong, and easily escape pursuit, and, it is said, will sometimes turn upon the hunters, neigh with all their might, and set off again at full speed. When closely pressed, they not only discharge their saliva against their enemy, but strike violently with the fore legs, and even use their teeth. The colour of the guanaco, with slight variations, is usually a deep rich fawn, verging to white on the under parts; the head is of a dull grey. The wool on the body is long, soft, and of a silky texture; on the head, neck, and limbs, it is short. The height at the top of the shoulder is about three feet and a half. The llama is more stoutly made than the guanaco, has much coarser wool, and more muscular limbs; its physiognomy is expressive of mildness and subjection; the profile, instead of exhibiting that arched outline so remarkable in the guanaco, being flat. Its colour is subject to much variety, being white, brown, black, and sometimes even mixed.

The pacos, or alpaca, is as large as the guanaco, but proportionally shorter on the legs; its forehead, instead of being regularly arched to the nose, rises abruptly prominent above the eyes; the wool is long, delicately fine, and silky, except on the head and limbs, and of a deep fawn colour; it is moreover disposed in long tufts, or tassels. Black varieties also occur, of which a most beautiful specimen some years ago existed in the gardens of the Zoological Society.

The alpaca dwells in herds among the mountains of Peru and Chili; it is less fleet than the guanaco, but its general habits are the same; it would appear, however, to frequent a higher range of elevation, as it is said to be seen in company with the herds of vicugnas.

The vicugna is a smaller animal than either the guanaco or the alpaca, and far more slenderly made; its limbs are long and thin, its neck swan-like, the forehead is broad and also prominent, but not abruptly so, as in the alpaca, the muzzle is very narrow and the head short, the eyes are large, the ears long. The height of the animal at the shoulder is about two feet six inches. The wool of the body is very delicate and soft, and of about an inch in length, that of the breast three inches; on the head and limbs it is close. The colour is pale brownish-yellow, passing into white on the under parts. The vicugna live in herds on the coldest and most elevated parts of the mountains, bordering the region of snow, amidst rocks and precipices beyond the pursuit of man. The Cordilleras of Copaipo, Coquimbo, and Peru are the principal seats of its abode, but it is also found in Chili. Its manners closely resemble those of the chamois, and it is as active and vigilant, as wild and timid. Its wool is highly prized, and for this alone thousands are annually killed, various means being employed in their wholesale destruction.

It would be very desirable that the characters of the wool produced by the alpaca and the vicugna should be rigidly ascertained by means of the microscope, as that of the various breeds of sheep has been by Mr. Youatt, whose observations on the structure of different wools, and on the causes to which their felting properties are attributable, constitute the most interesting and important chapters in his valuable work on the sheep, a work which cannot be read without pleasure and information. Upon a knowledge of the differences of structure, and the greater or less degree of felting property exhibited by the wool of the alpaca and vicugna, taking also fineness of substance into the account, will the manufacturer depend in turning the wool of these animals to the best account, that each may be respectively selected for the fabric for which it is best adapted. It would be desirable also to see how far an improvement in the wool could be effected by a mixture of the breeds or species.

According to the report of M. de Saint Vincent and Don Francisco de Theran, who paid considerable attention to the point, when in 1808 a small herd of these animals, sent to Cadiz, were placed under the care of the latter gentleman, the wool of the alpa-vicugna, a cross between the alpaca and vicugna, is longer and six times heavier than that of any other variety. The first object however is the naturalization of the animal, which we agree with Mr. Danson in thinking would be most advantageously attempted in Wales or Scotland,—this done, the rest will follow as a matter of course. Of the importance of the object little need be said—to every thinking mind it will be evident. We shall best learn how to appreciate it by reflecting upon the value of the sheep, with respect only to its fleece,—of the silkworm, with respect to the filmy envelope with which it surrounds itself, mummy-like, when about to undergo its metamorphoses. The products of the sheep and of the silkworm employ the labour of thousands in their conversion into various articles of clothing, useful and ornamental. In the manufacture of these products no trifling amount of capital is embarked, and from them originates a wide, a most important, and honourable branch of commerce, connected with our national interests and prosperity. That the fleecy produce of the llama will open a new field for the employment of capital and industry, and the encouragement of commercial enterprise, we have every reason confidently to anticipate.

NOTES ON THE NEW FOREST.—No. II

At page 359 some account was given of the general nature of the New Forest, and of its peculiar animals, as being the subjects most likely to make an impression upon the cursory passenger, inasmuch as the subjects and operations of the chase are the first which we naturally associate with a British forest. We shall now briefly advert to the locality and the extent of this very peculiar district of England,—a district which, although it is joined to the mainland of Hants and Wilts, more especially to the latter, is yet in some measure insulated by natural divisions. The district thus insulated does not wholly consist of afforested lands, and lands of this description nowhere actually reach the boundary, excepting toward Wilts; but still as the marginal lands, not included within the forest boundaries, are part of the district, that cannot be rightly understood without some reference to them. If we take these lands and the forest together, and describe the whole as they actually appear to an observer, we shall not perhaps be very wide of the truth, if we apply to them the description which King James once applied to the county of Fife in Scotland,—that the whole is like "a mantle of sackcloth with a certain hem;" for while the parties who have property round the margins of the forest have followed the example of others throughout the kingdom in making the most of their property, in respect both of beautifying and of fertilization, the forest itself, that is, the portion directly in the hands of the crown, and under forest law and the forest officers, has been upon the whole sadly neglected. It is true that, to those who wish to see what unaided nature, or nature perhaps a little crippled in her operations by man, can do in a particular district, this neglect of the forest affords an example to which there is nothing corresponding in the United Kingdom; but on the other hand, when we look at the natural importance of the timber of this forest, in its superior quality and proximity to the great naval building-yards and arsenal at Portsmouth, which is the most eligible place in the kingdom for the building of first-rate ships of war, we are constrained to view the matter in another and a different light. This is not however the view which we have to take in the meantime, because we must look to the natural position and soil of the district, before we are in a proper condition for taking either a landscape or an economical view of its vegetable productions, more especially of its timber, upon which, pre-eminently, and almost solely, its national value depends.

The New Forest district is an irregular triangle, of which the three angles are at Calshot Castle on the east, between the Southampton Water on the north-east and the Solent on the south-east; the Black Hill in Rookbourndown, on the borders of Wilts, on the north-west; and Dunley Chine, within about a mile and a half of Poole harbour, on the south-east: the entire length of the north-east and south-west sides of this triangle, taken on the straight line, may be about twenty-five or twenty-six miles; and that of the remaining side, which lies northwards inclining a little to the east, is about twenty miles but the triangle contained by those lines is less in surface than the district politically considered as part of Hampshire, inasmuch as more of the surface lies without the lines on the south-eastern and north-eastern sides, than lies within that on the western. If, however, we take the district as naturally bounded by the river Avon on the west, westward of which river no part of the forest ever extended, the surface of the triangle which we have named will be very nearly that of the forest district. Taking this natural view of it, it may in great part be said to be insulated. It is bounded by the sea on the south and south-east, from Dunley Chine to Calshot Castle; and, taking the windings of the coast, without reference to the minor æstuaries, creeks, and harbours, the sea-beach here measures about thirty-two miles. Then, on the north-east, from Calshot Castle up to Redbridge, where the river Usk falls into the Southampton Water, the coast-line, estimated in the same way, is about eleven miles in length. Putting these together, we have a sea-coast of about forty-three miles bounding this small district. Then again, if we take the river Avon, from near Hale, where it enters Hampshire, to the entrance of Christchurch harbour, we have, without noticing the smaller flexures, a river-boundary of about twenty-two or twenty-three miles; and this, added to the sea-boundary, gives a definite water-line of sixty-six miles separating this district from every other part of England. Turning to the land-boundary properly so called, we have, not including the flexures, above fourteen miles, the first five of which, from Redbridge to Cadnam, have Hampshire on the north, and therefore no artificial line of demarkation, any more than they have a natural one; but the remaining nine miles, from a little to the westward of Cadnam, to the Avon near Hale, have the county of Wilts on the northern side; and as a high down rises in this place, it may be considered as the isthmus by which the natural district of the forest is joined to the rest of England; and as the principal rivers in the forest have their sources at no very great distance from this high down, it is a good point of reference in forming a general idea of the slopes and other surface appearance of the district.

[To be continued.]

Art of Cookery amongst the Aborigines of Australia.—The aborigines of Australia are often driven for subsistence to the most wretched food, as snakes and other reptiles, grubs, lizards, and the larvæ of the white ant. When they do obtain better food, they prepare it with more care than might be expected. In cooking fish, they wrap it in soft bark and place it in hot ashes. By this process an acid from the bark is communicated to the fish, which gives it a most agreeable flavour. Mr. Ogle, in his account of the colony of Western Australia, describes the native mode of cooking a Kangaroo steak:—"It is placed in a scooped-out stone, which is readily found in the streams, and pressed down by heavy stones on the top of it; the heat is applied beneath and round the first top stone; at the critical moment the stones are quickly removed, and the steak appears in its most savoury state."

RICHARD CROMWELL AND HIS WIFE.

[Dorothy, wife of Richard Cromwell.]

On the 12th of February, 1649, or scarcely a fortnight after the execution of Charles I., Oliver Cromwell wrote to his "very worthy friend Richard Major, Esq., of Hursley in Hampshire," to tell him that he had received a letter from Mr. Robinson, preacher at Southampton, concerning the reviving of the last year's project of marrying his son Richard Cromwell to Mistress Dorothy, the eldest daughter of the said Richard Major, and enclosing a letter from Mr. Major himself, expressing his willingness "to entertain any good means for the completing of that business." The epistle, which is exceedingly characteristic of old Noll, continues thus:—"From whence I take encouragement to send my son Richard to wait upon you, and by him to let you know that my desires are (if Providence so dispose) very full and free to the thing, *if upon an interview there prove also a freedom in the young persons thereunto.* What liberty you will give herein, I wholly submit to you. I thought fit in my letter to Mr. Robinson to mention somewhat of expedition, because indeed I know not how soon I may be called into the field, or other occasions may remove me from hence, having for the present some liberty of stay in London. The Lord direct all to his glory."* A fortnight after writing this letter Oliver penned another, thanking Mr. Major for the kind reception and the many civilities he had afforded his son, especially in the liberty given him to wait upon his worthy daughter, "the report of whose virtue and godliness," continues Oliver, "has so great a place in my heart, that I think fit not to neglect any thing on my part which may conduce to consummate a close of the business, if God please to dispose the young ones' hearts thereunto, and other suitable ordering affairs towards mutual satisfaction appear in the dispensation of Providence." The lord-general was too busy "by reason of public occasions" to be able to go into Hampshire upon this matrimonial business, but he despatched his good friend Mr. Stapleton to act on his behalf, and to assure the family that as for settlements he would gladly do whatever might be expected from him. It appears that the young ones' hearts were so well disposed towards each other after a short intercourse, that the marriage was settled between them. But the old gentlemen and the law settlements required more time; and at one of the busiest and most critical periods of his life, Cromwell arranged with his own pen the always difficult and delicate questions of jointure, survivorships, &c.

Perhaps there are no documents existing that throw more light on the private character of the "magnanimous usurper" than these family letters to Mr. Major. Though speaking like a man of business, and though by no means inattentive to the worldly interests of his son and the rest of his children (who needed this care, for the conqueror of the king, the man who had really finished the civil war, had little or no property beyond what he had inherited from his family or obtained with his wife), he is discreetly generous, liberal-minded, and uncommonly frank and straightforward. He indeed mixes religion with business, and continually speaks of his desire and principle of "waiting upon Providence;" but they have taken the most vulgar and at the same time the falsest view of his character who fancy that all this was sheer hypocrisy. In a letter dated 14th March, he says to Mr. Major,—"Indeed, sir, I have not closed with a far greater offer of estate, but rather chose to fix here; I hope I have not been wanting to Providence in this. I have made myself plain to you, desiring you will make my son the messenger of your pleasure and resolution herein as speedily as with convenience you may."

In the same letter he speaks of his limited means, of the necessity of some equality in the contract, and of the rest of his children. "I have," he says, "two young daughters to bestow, if God give them life and *opportunity*. According to your offer, I shall have nothing left for them,—nothing at all in hand; and if my son die, what consideration is there to me? . . . . But for these things, I doubt not but, one interview between you and myself, they might be accommodated to mutual satisfaction; and in relation to these, I think we should hardly part, or have many words, so much do I desire a closure with you." Oliver then proceeds to deal freely with his brother elect, and to show him in what respects the marriage settlements proposed by him are objectionable. The manor of Hursley was to be settled by Mr. Major upon the young couple. "But," says Oliver, "the settling of the manor, as you propose it, sticks so much with me, that either I understand you not, or else it much fails my expectation. As you offer it, there is 400*l.* per annum charged upon it. For the 150*l.* to your lady for her life as a jointure, I stick not at that, but the 250*l.* per annum until Mr. Ludlow's lease expires (the tenure whereof I know not), and so much of the 250*l.* per annum as exceeds that lease in annual value, for some time also after the expiration of the said lease, gives such a maim to the manor of Hursley as indeed renders the rest of the manor very inconsiderable. Sir, if I concur to deny myself in point of present monies, as also in the other things mentioned as aforesaid, I may and I do expect the manor of Hursley *to be settled without any charge upon it*, after your decease, saving your lady's jointure of 150*l.* per annum, which if you should think fit to increase, I should not stand upon it: your own estate is best known to you, but surely your personal estate, being free for you to dispose, will, with some small matter of addition, beget a nearness of equality, if I hear well from others. If the difference in that were not very considerable, I should not insist upon it. What you demand of me is very high in all points. I am willing to settle as you desire in every thing, saving

* This and the other letters relating to Richard's marriage with Dorothy Major were transcribed from the originals (which were found at Pusey in Berkshire, the seat of the Dunches, who had intermarried with the Majors) by Horace Walpole, and were published by Harris in an appendix to his 'Life of Oliver Cromwell.' We have modernised the orthography, and altered Harris's punctuation, which occasionally made the sense unintelligible.

for present maintenance 400*l.* per annum. I would have somewhat free to be thanked by them for. The 300*l.* per annum of my old land for a jointure after my wife's decease, I shall settle; and in the meantime out of other lands at your election; and truly, sir, if that be not good, nor will any lands, I doubt. I do not much distrust your principles in other things have acted you towards confidence. You demand, in case my son have none issue male, but only daughters, then the lands in Hampshire, Monmouth, and Gloucestershire to descend to the daughters, or 3000*l.* a-piece; the first would be most unequal, the latter is too high; they will be well provided for by being inheritrixes to their mother, and I am willing to 2000*l.* a-piece to be charged upon these lands. Sir, I cannot but with very many thanks acknowledge your good opinion of me and of my son, as also your great civilities towards him; and your daughter's good qualities (whose goodness though known to me only at such a distance by the report of others) I much value, and indeed *that* causeth me so cheerfully to deny myself as I do in the point of monies, and so willingly to comply in other things; but if I should not insist as before, I should in a greater measure deny both my own reason and the advice of my friends than were mete, which I may not do."

[To be Continued.]

THE RUSSIAN EMPIRE.—AGRICULTURE AND MANUFACTURES.

[Continued from No. 490.]

In addition to the work carried on in factories, there is a great amount of industry engaged in household manufactures. These afford employment during the winter, and also at other times, as they may be suspended or resumed at convenience. Mr. Venables tells us that "the exercise of various arts on a small scale in private houses, either for profit or home consumption, is very great." "Many ladies employ a number, generally the children of household servants, in embroidering and making all kinds of fancy-work." "Women are employed in spinning, weaving, knitting, carpet-weaving, &c., for the raw material in Russia is worth little, and the manufactured article alone is valuable in the market." Almost all travellers in Russia speak in terms of praise of the industry of the peasants' wives; and the same causes which lead the richer classes to employ their dependants in giving value to an article by the skilful labours of the needle, direct the female peasants to the means of increasing their humble comforts at a small expense, while time is profitably filled up for which there is no other demand. Captain Cochrane, the pedestrian tourist, says:—"The women (wives of the peasantry) I have always found engaged in some employment: they make very good coarse woollen cloths and linens, as well as knit stockings and spin thread. The whole work of the house is thrown upon them, while they also partake the labours of the field." In the towns and villages on the banks of the Kolyma, in Eastern Siberia, "the women embroider gloves, caps, boots, and various things, in a very neat manner."

There can be no doubt, therefore, that Russia manufactures for her own consumption an immense quantity of cotton, linen, and woollen goods. The government makes great exertions to encourage home manufactures, and its agents abroad are directed to forward models of all new machinery and patterns of new manufactures to St. Petersburg, and foreign workmen are not unfrequently engaged by them to conduct Russian factories. Within the last few years great efforts have been made to improve the quantity and quality of Russian wool. The Merino sheep has been successfully naturalised, not only in the central and southern governments, but in Esthonia and Livonia, on the shores of the Baltic, where, though nature has done less, the great care which is necessary in the management of a sheep-fold has occasioned the improvement of wool to be equally if not more rapid than in more favoured provinces. In 1832, a Society for the Improvement of Wool was formed in Siberia. The first Merino sheep were introduced into the Russian empire less than thirty years since, and there are now about a million in the government of Jekaterinoslaw, and in the Crimea and the government of Cherson probably by this time nearly as many. In 1826 the exports of wool from Russia amounted to 35,800 poods; in 1834 to 281,450 poods. The purchase of Russian wool for the English manufacturer has greatly increased within the last few years, the imports of wool from Russia in 1820 having been 75,614 lbs., and last year 3,769,102 lbs. Our exports of woollen goods have decreased, being valued at 346,331*l.* in 1820, and at 94,419*l.* in 1838. The raw material in Russia has not only increased in quantity and value, but the increase has been accompanied by greater facilities in working it up for home consumption. It is only within the last twenty-eight years that factories on a large scale have been established. From 1822 to 1830 the quantity of cloth manufactured had increased from 6½ to 8 million 'arskeens;' and in the latter year two-fifths were of coarse quality, for the use of the army, two-fifths of middling, and one-fifth of fine quality.

When Mr. Tooke wrote his account of Russia, there were but eight cotton factories in the empire. Since 1824 the cotton manufacture has made rapid progress, as may be inferred from the following facts:—

Cotton yarn and twist exported to Russia from the United Kingdom:—

1820 . .	8,762,324 lbs.
1830 . .	18,555,753
1837 . .	24,108,593

Cotton goods exported to Russia:—

		1820.	1837.
White or plain cottons .	yds.	9,754,460	980,779
Printed or dyed cottons . .	„	3,449,391	145,760
		13,203,851	1,126,539

In 1835 new cotton-spinning establishments were formed at St. Petersburg, Moscow, and Kalouga.

Great efforts have been made to establish the silk manufacture, and especially to produce the raw material. The mulberry-tree is grown as far north as the Governments of Minsk, Poltawa, and Mohilew, and southward to the base of the Caucasus. Near all the principal towns of the south, large plantations of mulberry-trees have been planted within the last few years. In the Government of Charkoff, particularly, 15,000 trees are planted every year at the expense of the crown, and valuable privileges are in all cases afforded to those who embark their capital in the production of silk.

We have not the means of ascertaining the progress of manufactures in hardware and cutlery, but the advance which has been made in this branch has not been so great as in the cotton, silk, and cloth manufactures. In 1832 we exported 4596 cwts. of hardwares and cutlery to Russia, valued at 27,619*l.*; and last year 7082 cwts., valued at 36,830*l.* Russia annually imports edge tools and scythes from Austria of the value of 80,000*l.* In 1835 a manufactory of surgical instruments at St. Petersburg furnished the army and the public departments with instruments of the value of 184,000 roubles. In the same year a company was established at St. Petersburg for the manufacture of plated goods.

The total number of manufacturing concerns in the empire in 1835 was 6045, of which 381 were established in that year. Mines, forges, and furnaces are not included in this enumeration. Thirty-five applications were made in 1835 for patents connected with manufac-

tures, and eleven were granted. The following table indicates several interesting facts in connection with the progress of manufacturing industry in Russia :—

	No. of Factories in the Russian Empire in 1812.	1824.	Value of Goods manufactured in 1824.	Manufactured Goods Imported into Russia in 1820.	1824.
			£	£	£
Cloth . .	136	324	2,613,974	977,816	402,350
Silk . . .	105	184	444,264	458,892	292,569
Linen . .	170	214	467,660	104,169	8,286
Cotton . .	129	484	1,620,201	1,003,314	455,362
			5,146,099	2,544,281	1,158,573
Steel, Iron, & Needle	33	170			
All others	1754	3910			
Total	2327	5286			

There can be no doubt that the aggregate results of the manufacturing industry of Russia are at present very great; and there is every prospect of their annually increasing. The distribution of the various manufactured products, of which there is a surplus, must be noticed at another time. Thirty years ago, the Russian nobility, deprived of a market for the raw produce of their vast estates, loudly demanded the restoration of commercial rights, and the abolition of the continental system of Napoleon. The emperor Alexander was in consequence induced to issue an ukase, dated 31st December, 1810, which permitted colonial and other goods to be imported, "unless they appeared to belong to subjects of Great Britain." Such a restriction was easily evaded; the trade with England became once more open; and a coolness ensued between the two emperors, which led to the invasion of Russia, and finally contributed to hasten the downfall of Napoleon. The interests which have grown up since these stirring events have, it is to be feared, rendered numbers of the Russian manufacturing landowners friends of the prohibitive system and the enemies of commercial freedom.

Some account of Odessa, the chief port of Russia in the Black Sea, will be given in a future number.

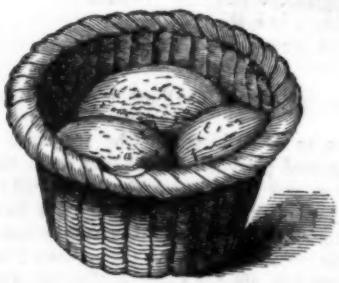
PETRIFIED BASKET OF EGGS.

In excavating the London and South-western Railway, near Winchester, there was found a basket of eggs, of which the cut at the end of this article is a representation. The precise locality or depth at which the basket was found has not been mentioned; but there is a rumour that it was found in the deep cutting behind the barracks, or king's house, as it is termed, on the west side of Winchester, and near the Romsey road; and that the depth at which it was found was between 30 and 40 feet, the pit in which it had been originally deposited, whether by design or accident no one can now determine, having been filled up by chalk. This basket, as may in part be judged of from the figure, has been plaited of willows much in the same manner as the ruder kind of baskets are at the present day, and the rim or margin at the top is plaited in exactly the same manner. There has apparently been a bow or handle over it in the original state, but that is entirely gone. The basket is, in the average of its dimensions (for it has been a little crushed and put out of shape), about five inches and three-quarters in diameter at the top, and four inches and a half at the bottom; and it is three inches in average height, though the side placed forwards in the representation is crushed down, and has less height than the other parts, giving the rim an oblique form. The rim is about three-quarters of an inch thick; and the willows of which that and the rest of the basket have been formed are about the thickness of a goose-quill. The eggs are three in number, rather larger than pullet's eggs of the present day, and may probably have been eggs of some aquatic bird. Two of them are entire, but one has been broken by some means, and the escape of its contents appears to have corroded a part of the bottom of the basket. These eggs are honeycombed all over with shallow indentations, which would lead one to believe that they had been originally blotched or spotted over with some colouring matter; and one might conclude that the iodine or other matter which colours such eggs had eroded the surface, only that there are similar indentations in the rim of the basket, though fewer in number and less conspicuous than those of the eggs. Except these indented marks, two of the eggs seem perfectly entire, and the third one is also entire in the upper part, the fracture being below. Eggs and basket are now completely soldered into one mass, so that they cannot be separated; and the whole has been converted, not into black flint, like what is usually found in chalk, but into grey flint, or chert, as it is termed. This is rendered quite plain by a small piece, which has been chipped out of the side of the basket, and which is shown at the place marked by the letter *a*, where the fracture is conchoidal, exactly like that of glass, and the colour is grey. No fracture has been made of the eggs, or of any other part of the basket; but the whole appear of the same texture and consistency. This curious petrifaction is at present, or was lately, in the possession of Mr. Jackson, an apothecary, in Romsey, who purchased it from a collection of such curiosities as are met with in excavating the chalk, and which generally consist of shells, echini, the teeth and palates of sharks, and various other animal remains, obviously of marine origin. None of these are petrified, but consist of the same matter as if they were in a recent state; whereas this basket, which has evidently been placed in the chalk long after its accumulation, when these other matters were embodied in it, is, as has been said, converted into a silicious substance, approaching in appearance and consistency to those flints which are so abundant in the upper chalk, and which appear there in regular beds or layers, often forming an almost continuous stratum without any or much chalk intervening between them.

The little basket of eggs, though but a trifle of itself in the way of a curiosity, is important as showing that this conversion into flint can take place within a limited period, a period certainly shorter than that which is usually assigned for the duration of man upon earth. Baskets, and very handsome baskets, are made by very rude nations, and at a comparatively early stage, as is established by the fact of their being met with in the possession of those inhabitants of the northern part of the east coast of Australia, who had hardly made so much advance in any other art as to be able to construct for themselves even the rudest habitations. The ancient Britons, against whom the Romans fought, had made some advances in civilization, but still they were comparatively a rude people. Their skill in basket-making appears, however, to have been considerable; for some of the Roman writers mention baskets manufactured by the Britons, as being known and esteemed in the Roman markets; and that they were not constructed by the Romanised Britons, or those inhabitants of the island to whom the Romans had imparted a higher degree of civilization, is proved by the fact, that the epithet "painted" is applied to the Britons; and this epithet was applicable to them only in their rude and savage state; the working of a basket was among them a very natural transition from the construction of their huts or wigwams, which are described as being nothing but baskets of larger size and ruder workmanship, constructed on the earth as a basis. There is some reason to think that in those early times, when, from the greater abundance of wood upon the heights, the valleys of the streams were much more humid and marshy than they are at present, willows grew very abundantly in the southern counties; and it is by no

means improbable that the Willey, which passes by Wilton, or Willentown, the ancient and proper capital of Wiltshire, may have been named from the abundance of willows on its banks, and the fitness of them for the ancient trade of making baskets.

We are not to suppose that the basket now under description is so old as the time of the Romans; because it is not likely that, previous to their arrival, or even during the course of it, Winchester was so extensive as to have had wells, in one of which the basket is presumed to have been found, in the chalk so far to the westward of the present city. It is probable, however, that the depositing of this basket was not later than the early part of the twelfth century, as Winchester never appears to have recovered the loss and destruction which it sustained during the contest between King Stephen and the Empress Maud. The date, however, at which it was deposited is a matter of inferior consequence, and the main point is the conversion of animal and vegetable substance into a consistency closely approaching to that of flint, from having been buried in the chalk for a period of years much within the range of human history. There they are in contact, both eggs and basket are united into one mass; and although the willows of which the basket has been worked appear tolerably distinct and round on their outer sides, they are united at all their points of contact; and where the fracture of the rim has taken place, though the coils of the willow are quite apparent on the surface, the entire surface of the fracture is continuous, without the least appearance of being made up in pieces. It is worthy of remark too that the portions of chalk that remain adhering to the irregularities of this basket and its contents are remarkably pure, free from silicious matters, and colourless; although some of the chalk itself in the same part of the formation contains a considerable portion of silex, and has received a brownish tinge from a small admixture of iron. As the nature of the chalk over this remain of antiquity was not particularly noticed, no speculation can be entered into respecting it; it however establishes the point that if either a vegetable or an animal substance is placed to a sufficient depth in the chalk, so situated that water can percolate to it through a pretty thick stratum, and be there left for a sufficient length of time, the said vegetable or animal substance will be converted into flint, or something approaching to the nature of flint; and that, contrary to what takes place in vegetable petrifactions in strata different from chalk, the ligneous structure will be entirely obliterated, and the substance will become, in all else but its shape, what is usually denominated a flint-stone. The petrifaction of the eggs of birds is also a curious occurrence, but certainly not more curious than that of the wooden basket; for we believe that there are exceedingly few instances of the conversion of wood into flint.



[Width at Top, 5¼ inches; at Bottom, 4½ inches; Height, 3 inches; Rim, ¼ inch thick.]

Means by which the Mind acquires its Full Powers.—Besides the reasoning powers and the judgment, I spoke of the power of rapid and extensive combination, as one of the things which enabled the mind to be an universal instrument. Perhaps, strictly speaking, I ought not to give it a distinct place, for it is in many cases essential towards forming a sound judgment; but its great importance may justify me in bestowing some separate notice upon it. We live in a world so varied, that without this power of combination, our views must be exceedingly narrow, or exceedingly confused. They must be narrow, if, confining ourselves to one class of subjects and of relations, we understand them indeed in themselves thoroughly, so far as they can be understood thoroughly without considering them as acting or acted on by other things, but are wholly ignorant of all others: they must be confused, if, studying variously, and receiving ideas from many different sources, we let them lie confusedly upon one another, without arranging them into one great whole. The power of combination may be said to consist in a quick perception of likeness: in two different subjects we discern some one point bearing a resemblance to a common third; we group them together, and then notice their disagreements as well as their agreements: and this goes on continually with a multiplied power; for the more ideas we have thus grouped together in our minds, the more points are offered to which some new idea may attach itself.—*Dr. Arnold's Lecture, read before the Rugby Literary and Scientific Society.*

Manufactures in the Papal States.—Many a town of Great Britain, consisting of only 30,000 souls, produces a greater quantity of manufactured articles than the three millions inhabitants of the Pontifical States, notwithstanding the enormous sacrifices made by the Papal government, the protections, the prohibitions, the premiums given for the encouragement of what is called native industry. At Rome, as elsewhere, there has long existed a desire and a determination to introduce and to support a manufacturing interest—no matter at what sacrifice of other advantages, or of other interests—no matter at what cost to the agriculturists, at what loss to the treasury, at what hardships to the consumer; but in Rome, as elsewhere, the measures taken to increase and improve manufacturing produce have been the main causes of decline and decay. Premiums and protections have only served to reward and to render permanent the most rude and ignorant processes of manufacture; and prohibition, as far as it has succeeded (and it has succeeded of course in the coarser and cheaper articles, which cannot pay the smuggler's profits)—prohibition has kept away those superior foreign manufactures whose presence would have compelled improvement in the home production. I visited some of the woollen manufactures, being the most important. Scarcely a valuable discovery had been introduced: the spinning, in some cases by hand, in others by machinery, far behind the universal progress in England, Belgium, Prussia, or France; the looms such as were generally employed in the fourteenth century, little better than those used by the Indians of the Dekkan; the roving and carding all done by solitary workmen, and with the ancient teasels and hand-cards; the shearing with the antique hand-shears, such as have been employed from immemorial time; and in some places I saw the fulling performed by men half naked, employed to trample upon the cloth—a process, probably, not now to be found in any other part of the civilised world. How then can it be an object of wonder, if manufactures, instead of making progress, remain stationary or fall into decay, while rival productions move forward in the career of constantly improving change? In the hospital at Saint Michael they have the privilege of furnishing cloth for the apostolical palaces and for the pontifical troops. The manufacture employs nothing but the national wool. The spinning is done by hand, for the most part by women confined in the various prisons; the warping is also done by manual labour; and it is made a boast that no machinery is employed where the work can be done without it. There are 25 looms in the establishment, and 850 persons are employed. Thirty thousand *canne* of cloth (equal to about 77,500 yards) are said by M. Morichini to be the annual produce; and I should imagine they have the distinction of being the most costly cloth produced in Europe at the present time. There are twelve conservatories in Rome, containing 572 inmates in all (the average being 48, the smallest number 8, and the highest 100). In most of these some manufacture is carried on, but, I believe, wholly by hand-labour.—*Dr. Bowring's Report on the Statistics of Tuscany, &c.*

LONDON: CHARLES KNIGHT & CO., 22, LUDGATE-STREET.
Printed by William Clowes & Sons, Stamford-Street.